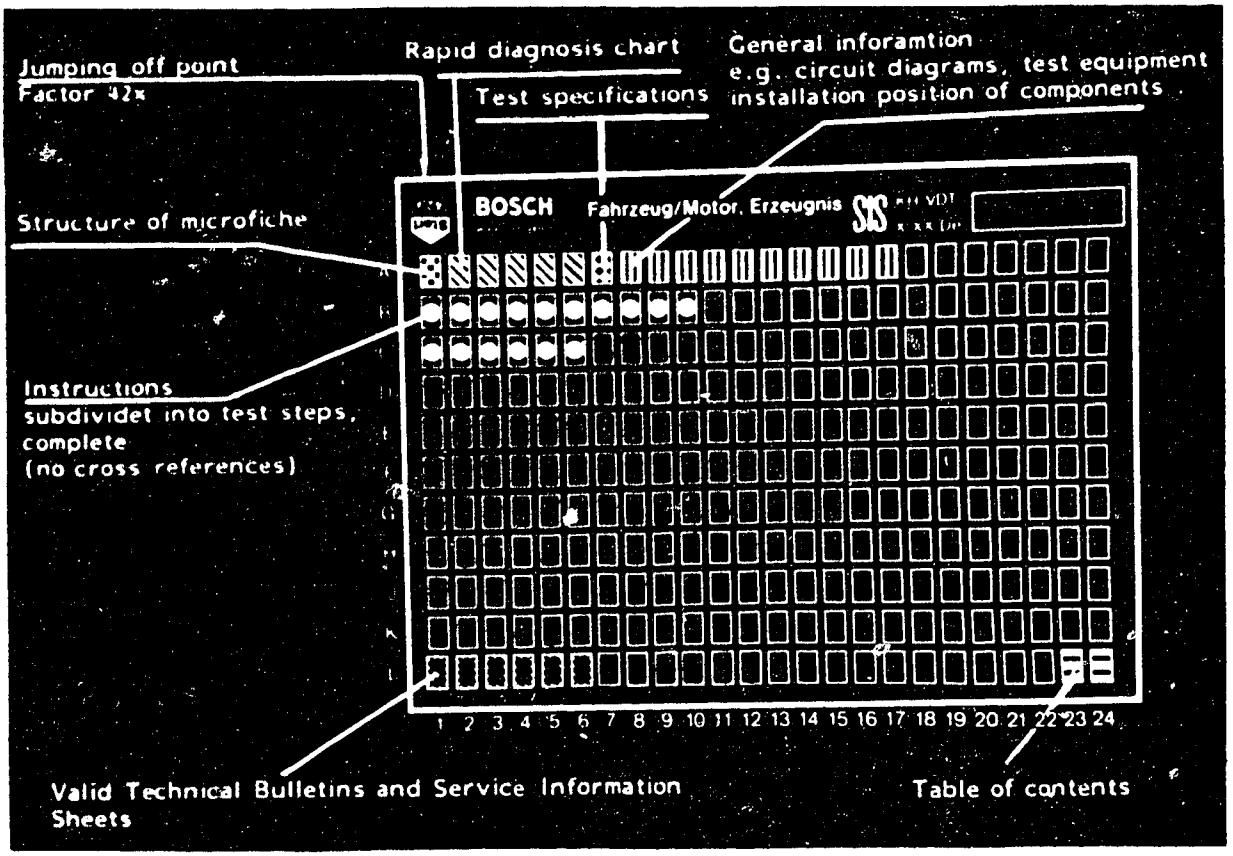
# Structure of microfiche




1. Read from left to right

2. Title of microfiche (appears on each coordinate)

| E 16 | Product/assembly/test step<br>Vehicle/engine | |
|---|---|---|

Coordinate

3. Limits of section

| Beginning | Mid-section | End | One-page section |
|---|---|---|---|

4. References to relevant test steps in test specifications; coordinate e.g. C6

**C6**

## 1. Rapid diagnosis chart

The following rapid diagnosis chart makes it possible for the experienced expert to quickly check the electrical/electronic part of the ignition system using normal workshop test equipment.

The rapid diagnosis chart contains the following information:

- Customer complaint
- Cause of the trouble
- Test instructions (if no coordinate given on the right, further possibilities for testing are indicated).
- Coordinates for detailed trouble-shooting.

If detailed information and instructions on trouble-shooting are necessary, always proceed according to the trouble-shooting program starting on coordinate B 1.

Rapid diagnosis chart

Customer complaint (symptom of trouble)

1. Starting motor operates, but engine fails to start
2. Rough idling
3. Poor throttle response
4. Engine lacks power
5. Misfiring
6. Fuel consumption too high
7. Engine pings when accelerating
8. Backfiring
9. Engine becomes too hot

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Cause of trouble | Test instructions | Coordinates |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ● | | ● | | Spark plugs defective | Assess: Remove spark plug and make visual examination. | - |
| ● | ● | ● | ● | ● | ● | ● | ● | ● | Ignition timing incorrect | See Autodata test specifications | - |
| ● | ● | ● | ● | ● | | | | | Shunt on secondary side | Assess ignition transformer, ignition distributor ignition harness and spark plug. Make visual examination. | - |
| ● | ● | ● | ● | ● | | | | | Open circuit on secondary side | Assess ignition transformer, ignition distributor, ignition harness and spark plug. Test for continuity using ohmmeter. | - |
| ● | | | | | | | | | Open circuit on primary side | Test voltage supply to trigger box. | C 3 |
| ● | ● | ● | ● | ● | | | | | Ignition transformer defective | Make visual examination, electrical test | B 5 |

Customer complaint (symptom of trouble)

| 1. Starting motor operates, but engine fails to start | 2. Rough idling | 3. Poor throttle response | 4. Engine lacks power | 5. Misfiring | 6. Fuel consumption too high | 7. Engine pings when accelerating | 8. Backfiring | 9. Engine becomes too hot | Cause of trouble | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ● | ● | ● | ● | | | | Interference-suppression resistors defective | Assess using ohmmeter. | |
| | ● | ● | ● | | ● | ● | ● | ● | Centrifugal advance defective | See Autodata test specifications | |
| | | ● | ● | | ● | ● | | ● | Vacuum advance defective | See Autodata test specifications | |
| ● | | | | ● | | | | | Tachometer defective | Test tachometer | B 9, C 5 |
| ● | | | | | | | | | Ignition distributor pickup system defective | Check pick-up resistance, pick-up winding short-circuit to ground, check pick-up system for mechanical damage | C 1 |
| ● | ● | ● | ● | ● | | | | | Engine-speed limiter defective | Test cut-out speed, or perform visual examination | |
| ● | | | | | | | | | Firing sequence incorrect | See Autodata test specifications | |

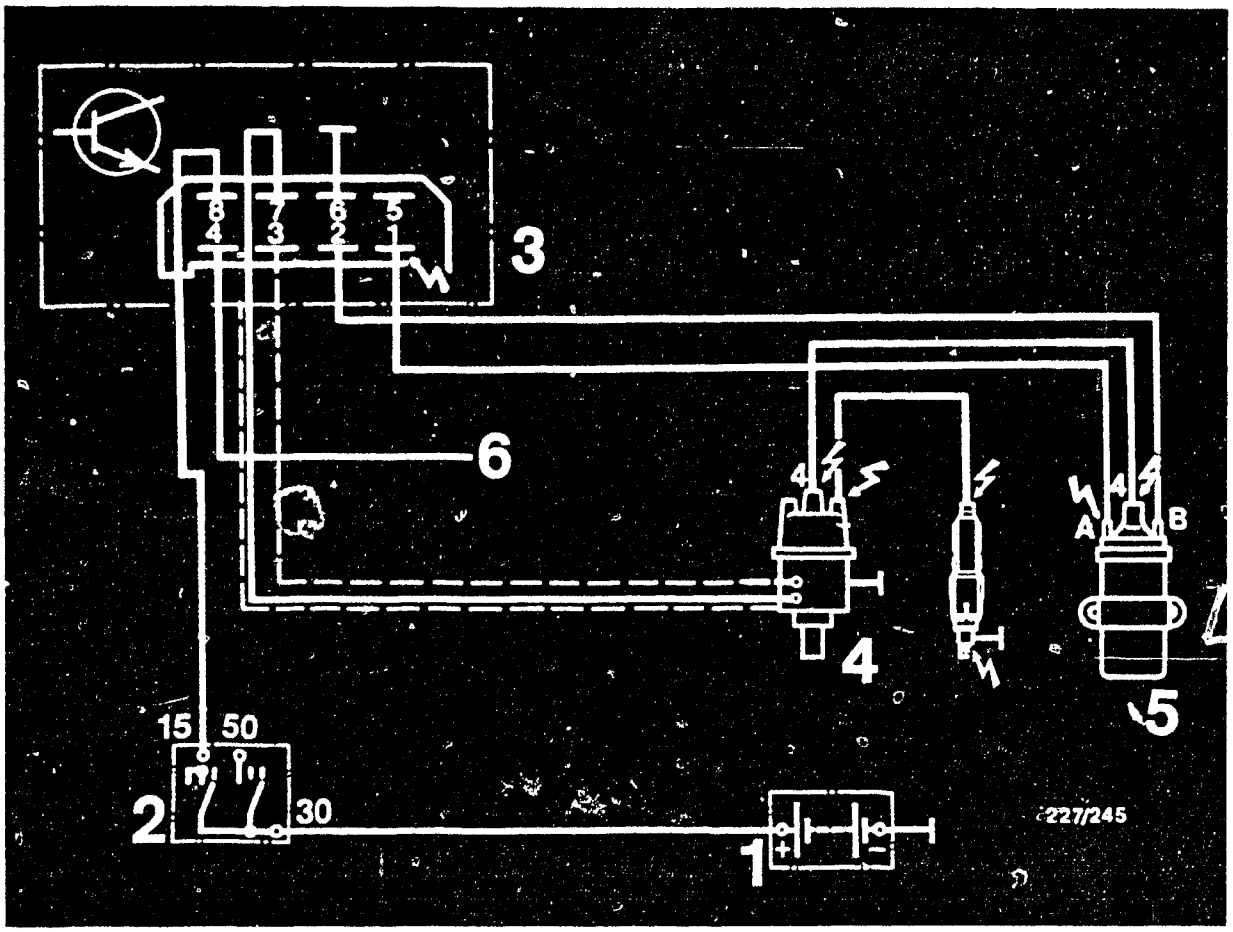
B5

| | |
|---|---|
| Ignition transformer, primary | 0.1 ... 0.2 Ω |
| Ignition transformer, secondary | 395 ... 766 Ω |

C1

| | |
|---|---|
| Resistance of coil section | 485 ... 850 Ω |
| Short-circuit to ground of coil section | R = ∞ |

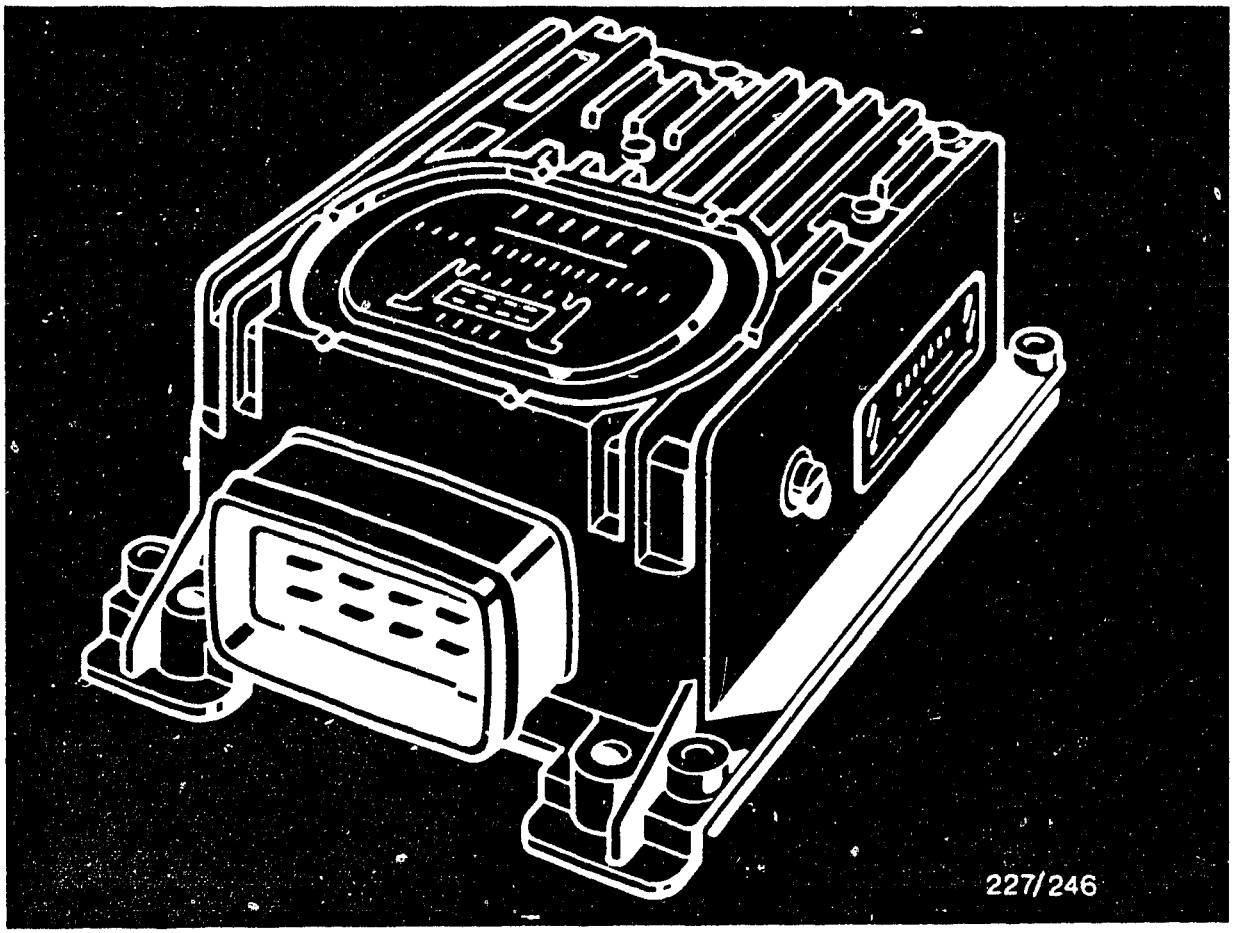
See Autodata test specifications for settings for ignition, idle speed, exhaust gas, valve clearance etc.




1 = battery
2 = ignition and starting switch
3 = trigger box
4 = ignition distributor
5 = ignition transformer
6 = to tachometer

ϟ = dangerous voltages (400 V - 25 kV)

## 3. Electrical terminal diagram




CDI-trigger box

## 4. Installation position of components

The trigger box is mounted in the engine compartment at the rear left (behind cover).

## 5. Necessary test equipment, aids

| | | |
|---|---|---|
| Motortester | MOT 201 | 0 684 000 201 |
| Spark gap e.g. Ignition coil and condenser tester | EFAW 106 A | 0 681 100 001 |
| or | | |
| Single spark gap | EF 1177/7 | 1 684 531 000 |
| 5 kΩ sleeve-type suppressor | | 0 356 500 001 |
| Ohmmeter or e.g. | ETE 014.00<br>Pontavi Wh2 | 0 684 101 400<br>Commercially available |
| Voltmeter e.g. | ETE 014.00 | 0 684 101 400 |
| Test prods | | Commercially available |

## 6. Danger of accident on electronic ignition systems

Increased demands of modern engines on the ignition system combined with the desire for freedom of maintenance have recently led to electronic ignition systems being fitted as standard. Usually the ignition power of electronic systems (of almost all manufacturers) is higher than that of conventional systems, and there are signs of further increases in power. Electronic ignition systems thus reach a power range which can be highly dangerous if live parts or terminals are touched (both on the primary as well as the secondary sides).

In this connection we should like to point out that the VDE regulations, in particular VDE 0104/7.67 and/or the respective national regulations must be followed when testing or working on the ignition system.

The ignition should always be switched off when working on the ignition system (switch off ignition or voltage source). Such work includes:

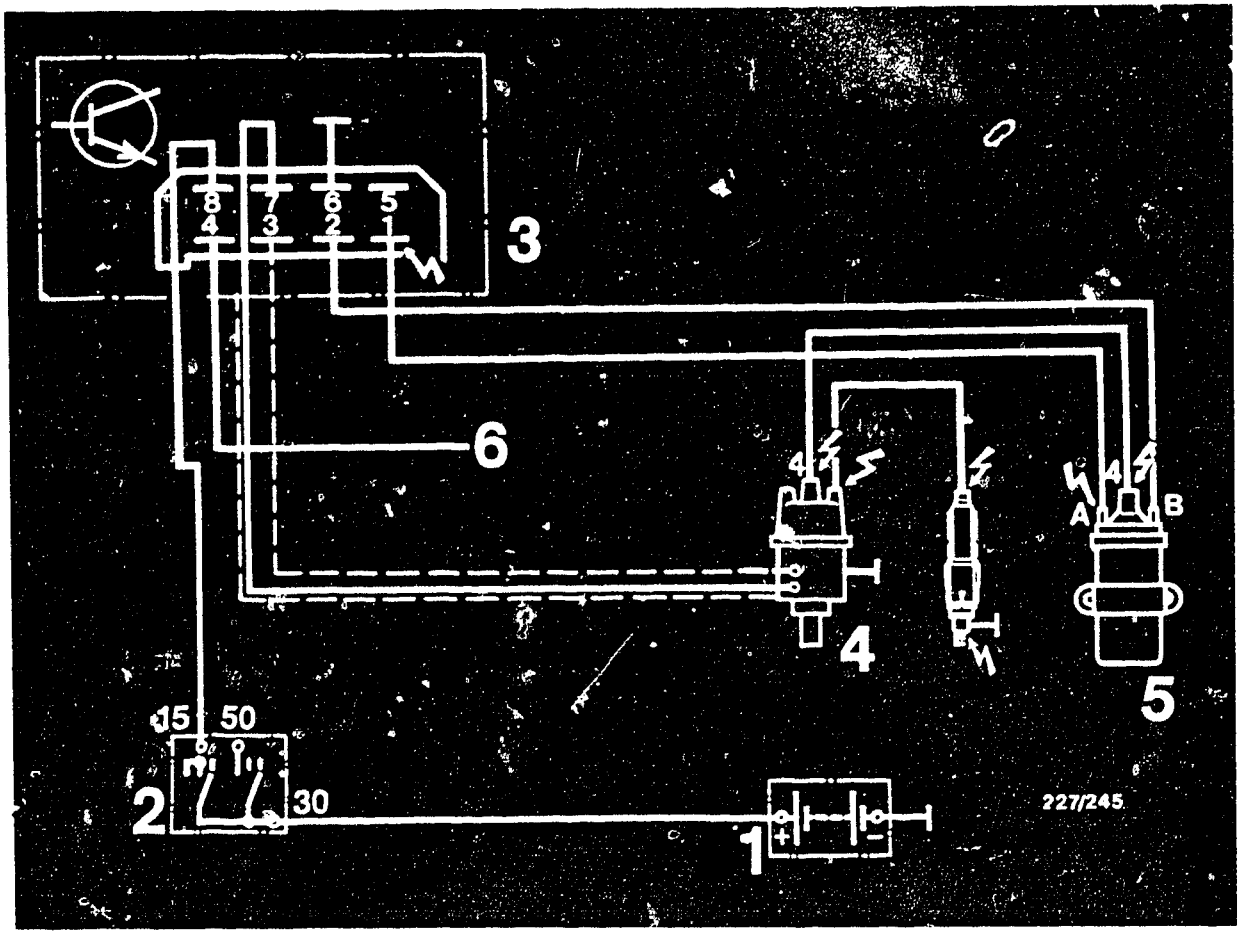
- Connecting of engine test equipment (timing light, dwell-tach tester, ignition oscilloscope, etc.).
- Replacing parts of the ignition system (spark plug, ignition coil, ignition distributor, H.T. ignition cable, etc.).

If, while testing the ignition system or during adjustment work on the engine (e.g. carburettor), it becomes necessary to switch on the ignition (switch on ignition or voltage source), the above-mentioned dangerous voltages occur over the entire system.

The danger of accident exists, therefore, not only on the individual assemblies of the ignition system (e.g. ignition distributor, ignition coil, trigger box, ignition harness), but also on the wiring harness (e.g. tachometer connection, diagnostic plug), at plug-in connections and test equipment.

In the case of capacitor-discharge ignition it must also be remembered that there is danger:

- when operating the trigger box without ignition transformer
- on the removed trigger box which had been switched on a relatively short time beforehand (capacitor discharge).




1 = battery
2 = ignition and starting switch
3 = trigger box
4 = ignition distributor
5 = ignition transformer
6 = to tachometer

⚡ = dangerous voltages (400 V - 25 kV)

Electrical terminal diagram

The dangerous locations are marked with danger arrows taking the example of the terminal diagram of an electronic ignition system.

## 7. Important vehicle information

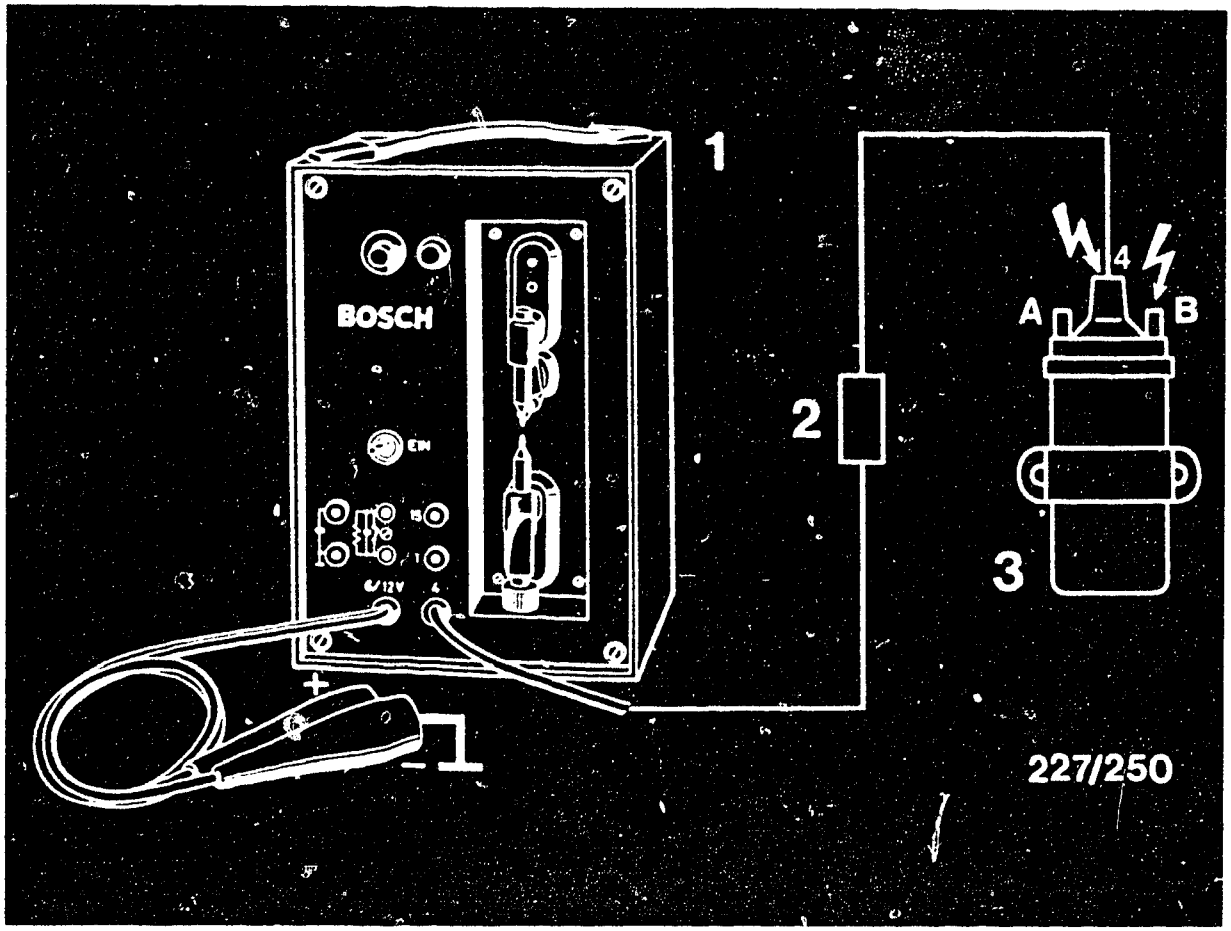
- During the compression test, remove the trigger-box plug or firmly ground ignition transformer term. 4 using auxiliary cable (dangerous high voltage, insulation damage to ignition transformer, ignition distributor, ignition harness).

  Note: Auxiliary cable must be interference-suppressed with at least 1 kΩ e.g. sleeve-type suppressor (5 kΩ) 0 356 500 001.

- Work on the ignition system, e.g. connection and disconnection of leads, must only be performed with the ignition off and with the trigger-box plug removed.

- Resistance measurements must only be performed with the ignition off or with the battery disconnected (measuring instrument defective).

- To prevent the trigger box from being irreparably damaged, the secondary side of the ignition system must have at least 1 kΩ interference suppression per ignition circuit.




1 = Spark gap
2 = 5 kΩ sleeve-type suppressor
3 = Ignition transformer

ϟ = dangerous voltages (400 V - 25 kV)

- In order to prevent the trigger box from being irreparably damaged, when using a spark gap, an interference-suppression resistor of at least 1 kΩ must be connected between the spark gap and ignition transformer terminal 4, e.g. sleeve-type suppressor (5 kΩ) 0 356 500 001.

- In the case of ignition distributors with engine-speed limitation the ignition distributor side terminal 4 must have 1 kΩ interference suppression. Operation without interference suppression will lead to the destruction of the trigger box.

- The holding springs of the distributor cap must not fall into the pulse generator system when the engine is being cranked with the dust-protection cover removed.

- Do not disconnect the battery with the engine running.

- Incorrect polarity of the battery will destroy the trigger box.

- Do not use a starting aid with more than 16 V or a fast charger for starting.

- The specified ignition transformer (see Part No.) must not be replaced by a different ignition transformer or an ignition coil.

- Under no circumstances must any devices, such as suppression capacitor, stroboscope, test lamp etc be connected to terminal A of the ignition transformer since there is up to 450 V across terminal A. When running, engines must not be switched off by using a wire jumper or a tool between terminal A (ignition transformer) and ground. Such actions will inevitably lead to the destruction of electronic components. Even after switching off the trigger box (ignition off) the lead to the ignition transformer (terminal A) must not be brought into contact with vehicle ground.

- The trigger box must not be operated without ignition transformer.

- Ignition cable from ignition transformer term. 4 to ignition distributor term. 4 must not be disconnected during operation.

- A 2.2 µF capacitor is installed in the CDI trigger box for radio interference suppression.
- The lead between induction-type pulse generator and trigger box must be shielded (malfunction of trigger box).
- To prevent misfiring (through capacitive interference), original ignition cables must be used.

## 9. Trouble-shooting program

### Procedure

The trouble-shooting program is divided into 3 rows of boxes.

The left-hand row contains test instructions and test specifications.
The center row contains repair instructions.
The right-hand row contains the illustrations/terminal diagrams belonging to the text and the explanation of the items in the picture.

If the questions asked in the left-hand row can be answered conclusively with "Yes", then proceed to the next test down.

If the answer to the question is "No", branch to the center row and carry out the tests given there.

### Before testing, make sure of the following:

Battery fully charged, fuel system O.K., engine mechanically O.K. (e.g. compression, valve clearance etc.). Ambient temperature/ignition system temperature 0° to+100 °C (temperature has a considerable effect on measured values).

## Beginning of trouble-shooting program

Starting motor operates, engine fails to start or misfires or lacks power.

Yes

Continued on B 3

Yes

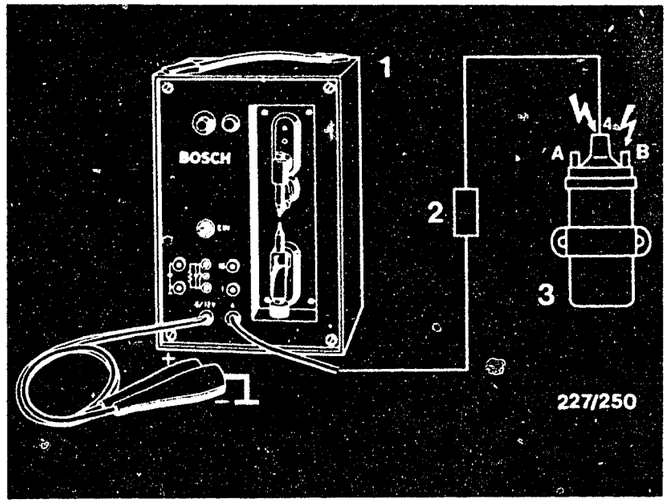
Test ignition spark.
Disconnect ignition cable 4 from ignition transformer.
Connect the spark gap including sleeve-type suppressor (5 kΩ) to ignition transformer. Adjust spark gap to 5 mm. Start the engine.
There must be sparks across the spark gap.

Ignition sparks across spark gap?

No → If no ignition spark, continue testing at C 1.

Testing as from B 5 not necessary.

Yes




1 = Spark gap
2 = 5 kΩ sleeve-type suppressor
3 = ignition transformer

ϟ = dangerous voltages (400 V - 25 kV)

Continued on B 5/6

yes

Test the distributor cap, rotor, ignition cables and spark plugs.

High-tension side O.K.?

No → Repair high-tension side

yes

Test ignition transformer

Ignition transformer primary (terminal A and B) 0.1...0.2 Ω (take resistance of test lead into account).

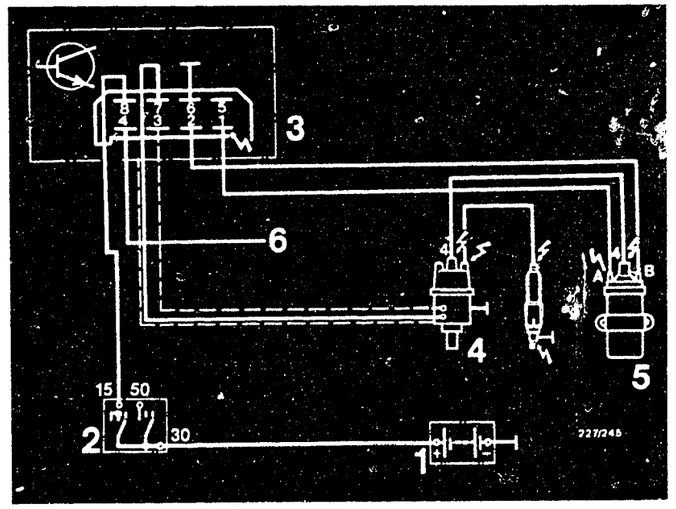
Ignition transformer secondary (terminal B and 4) 395...766Ω.

Resistance values O.K.?

No → Replace ignition transformer

yes

Continued on B 7/8




1 = battery
2 = ignition and starting switch
3 = trigger box
4 = ignition distributor
5 = ignition transformer
6 = to tachometer

ϟ = dangerous voltages (400 V - 25 kV)

yes

Engine running? — No → Disconnect the negative and positive cables from the battery. Disconnect the trigger-box plug. Switch on the ignition.
1. Check for contact resistance in cables from positive battery terminal to trigger box plug terminal 8 including the cables from the negative terminal of the battery to trigger-box plug terminal 6. Total contact resistance max. 0.3 Ω (take resistance of test lead with test prods into account).
Eliminate contact resistance.
2. Check for contact resistance in cables from ignition transformer terminal A to trigger-box plug 1 as we.l as cable from ignition transformer terminal B to trigger-box plug terminal 2. Total contact resistance max. 0.3Ω (take resistance of test lead with test prods into account).
If contact resistance under points 1 and 2 is smaller than 0.3Ω replace trigger box.

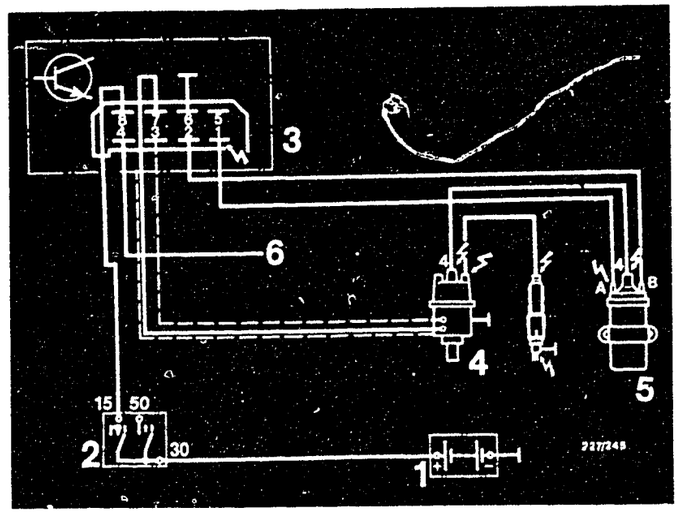
yes

Test ignition setting (Auto-data test specifications).

Adjustment correct? — No → Adjust ignition

yes

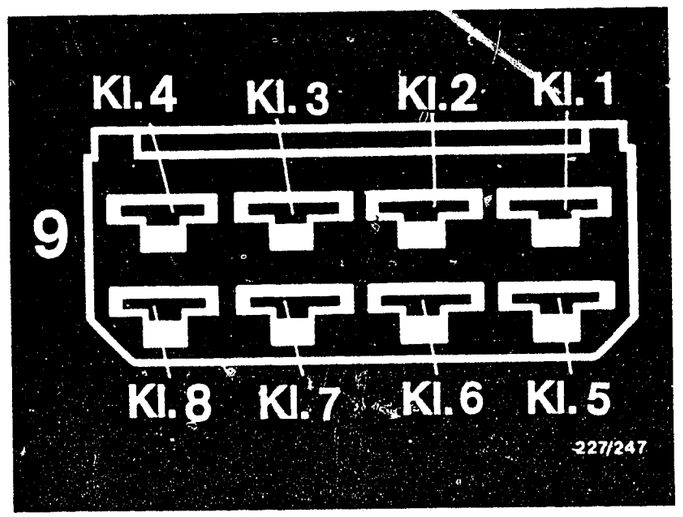
Continued on B 9/10




1 = Battery
2 = Ignition and starting switch
3 = Trigger Box
4 = Ignition distributor
5 = Ignition transformer
6 = to tachometer

ϟ = dangerous voltages (400 V - 25kV)

9 = Trigger-box plug



Yes

Test cables and plug-in connections.
Test cables and plug-in connections of ignition system (see terminal diagram) for loose contact and oxidation.

Cables and plug-in connections O.K.?

No → Remedy defects.

Yes

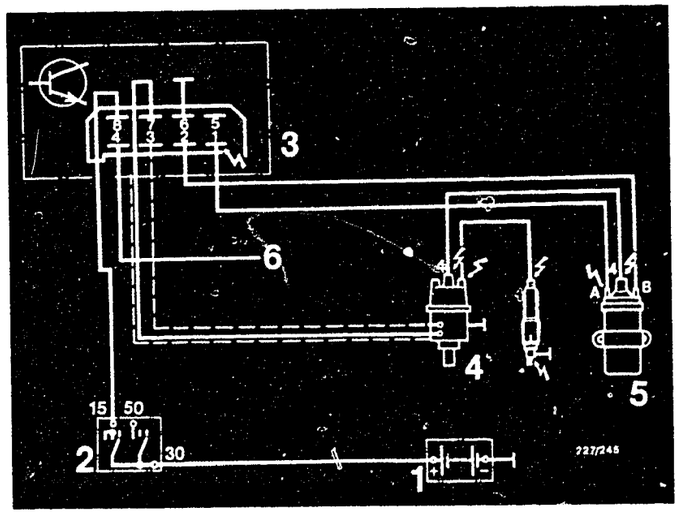
In case of misfiring:
Disconnect tachometer. If misfiring has now stopped, the tachometer is defective.

Misfiring remedied?

No → Replace trigger box.

Yes

Ignition system O.K.
Testing completed
Tests from C 1 onward are not necessary.
Note:
If customer's complaint is still not remedied, there may be a fault in the fuel system or the engine is not mechanically O.K.




1 = Battery
2 = Ignition and starting switch
3 = Trigger box
4 = Ignition distributor
5 = Ignition transformer
6 = to tachometer

ϟ = Dangerous voltages (400 V ~ 25 kV)

No ignition spark.
(Continued from B 3)

Yes

Test resistance of coil section including electric cable.
Remove trigger-box plug. Connect ohmmeter to disconnected trigger-box plug between term. 3 and term. 7. Ohmmeter must indicate 485...850 Ω.
Resistance O.K.?

No → Replace coil section/ignition distributor or electric cable.

Yes

Test short circuit to ground of coil section and electric cable.
Connect ohmmeter to disconnected trigger-box plug at term. 3 or term. 7 and vehicle ground. Ohmmeter must indicate infinity (∞ ).
Resistance (∞ ) O.K.?

No → Replace coil section/ignition distributor or electric cable.

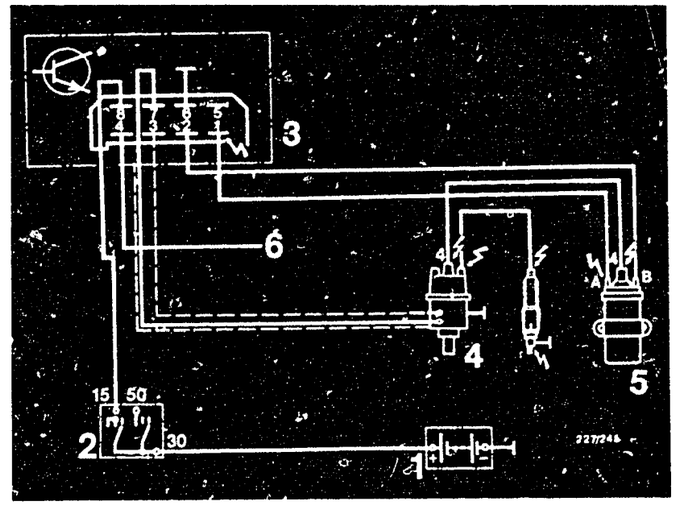
Yes

Test ignition pulse generator for mechanical damage.
Visual examination: Trigger wheel must not rub against teeth of ignition pulse generator. Ignition pulse generator O.K.?

No → Replace ignition pulse generator/ ignition distributor.

Yes

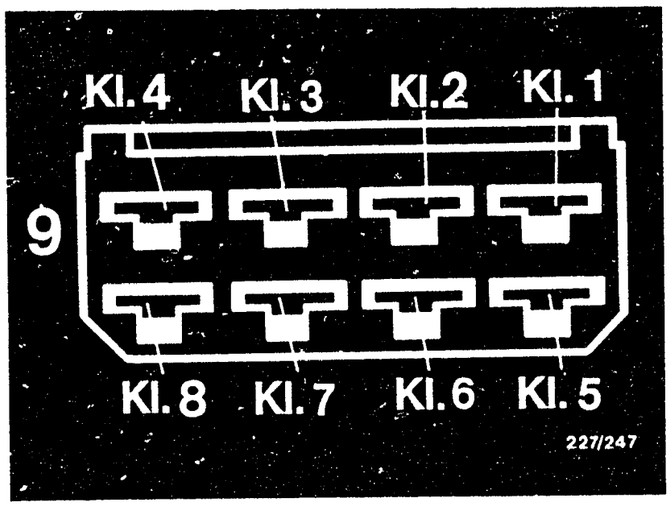
Continued on C3/C4




1 = Battery
2 = Ignition and starting switch
3 = Trigger box
4 = Ignition distributor
5 = Ignition transformer
6 = to tachometer

⚡ = Dangerous voltages (400 V - 25 kV)

9 = Trigger-box plug



yes

Test trigger box voltage supply.
Connect the voltmeter to the disconnected trigger box plug between terminals 8 and 6.
Switch on the ignition.
Voltmeter must show battery voltage.

Voltage value O.K.?

no → Check for open circuit in cables and terminals from ignition and starting switch to trigger box terminal 8 including ground cable terminal 6. Eliminate open circuit.

yes

Test primary circuit

Connect ohmmeter to the disconnected trigger box plug between

| trigger box plug | ignition transformer |
|---|---|
| terminal 1 | terminal A |
| terminal 2 | terminal B |

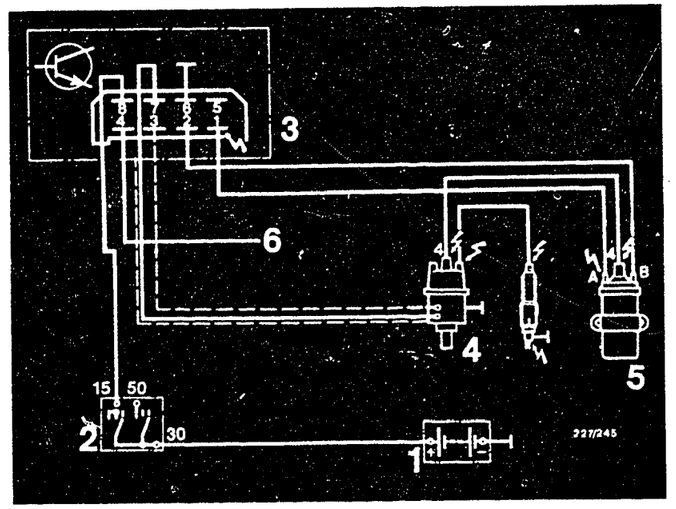
The ohmmeter must in each case show continuity.

Is continuity shown?

no → Eliminate open circuit.

yes

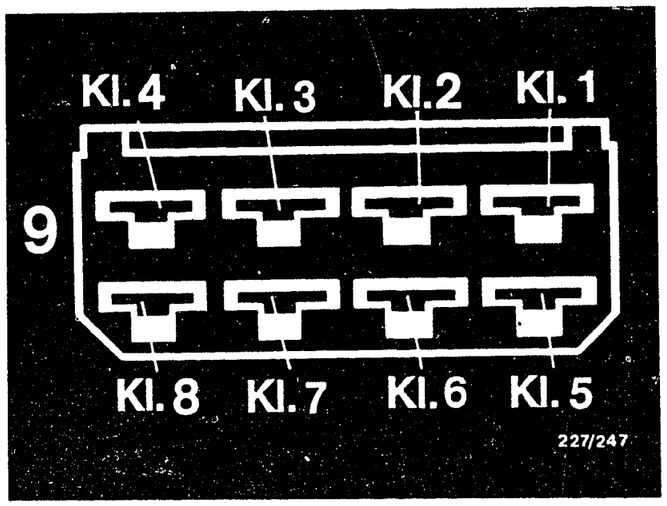
Continued on C 5/6




1 = Battery
2 = Ignition and starting switch
3 = Trigger box
4 = Ignition distributor
5 = Ignition transformer
6 = to tachometer

⚡ = dangerous voltages (400 V - 25 kV)

9 = Trigger box plug



yes

Test ignition transformer
Ignition transformer primary circuit
(terminals A and B)
0.1...0.2Ω (take resistance of the
test lead with test prods into account)
Ignition transformer secondary circuit
(terminals B and 4) 395...766Ω.
Resistance values O.K.?

no → Replace ignition transformer

yes

Test tachometer.
Disconnect tachometer.
If there is a spark now,
the tachometer is defective.

Tachometer O.K.?

no → Replace tachometer

yes

Replace trigger box.
Test completed.
Test on B5 not necessary.
Please note:
If the cause of the customer's
problem is not eliminated, then
there are further faults in the
fuel system or the engine is
not mechanically O.K.

# After-sales Service

## Technical Bulletin

Only for use within the Bosch organization. Not to be communicated to any third party.



Danger of Accident on Semi-conductor Ignition Systems

VDT-I-227/102 B

11.1976

Please be sure to pass this bulletin on to your employees for their attention.

The increased demands made on their ignition systems by modern engines, and the wish for freedom from maintenance, led some time ago to manufactures starting to equip their vehicles with semi-conductor ignition systems as original equipment. In most cases the performance of nearly all makes of systems is higher than that of conventional systems, and further improvements are to be expected. This means that semi-conductor ignition systems have reached the point where contact with "live" parts or contacts (whether on the primary side or the secondary side) can prove fatal.

In this connection we should like to point out to you that the laws valid in your country regarding work on high-voltage systems must be adhered to when working on, or testing, semi-conductor ignition systems.

As a matter of principle, when working on such ignition systems the ignition is to be switched off. Included in such work are the following operations:

- Connection of engine testing equipment (timing light, dwell-tach tester, ignition oscilloscope etc.).
- Replacement of ignition system parts (spark plugs, ignition coil, ignition distributor, H.T. ignition cables etc.).

If it is necessary to switch on the ignition in order to test the system or make adjustments on the engine (to the carburetor for instance), then lethal voltages are present throughout the entire system.

This means that the danger of accident exists not only at individual components in the system (e.g. ignition distributor, ignition coil, trigger box, ignition harness), but also at the wiring harness (e.g. connection for the tachometer, diagnostic connector), on terminals, and on test equipment.

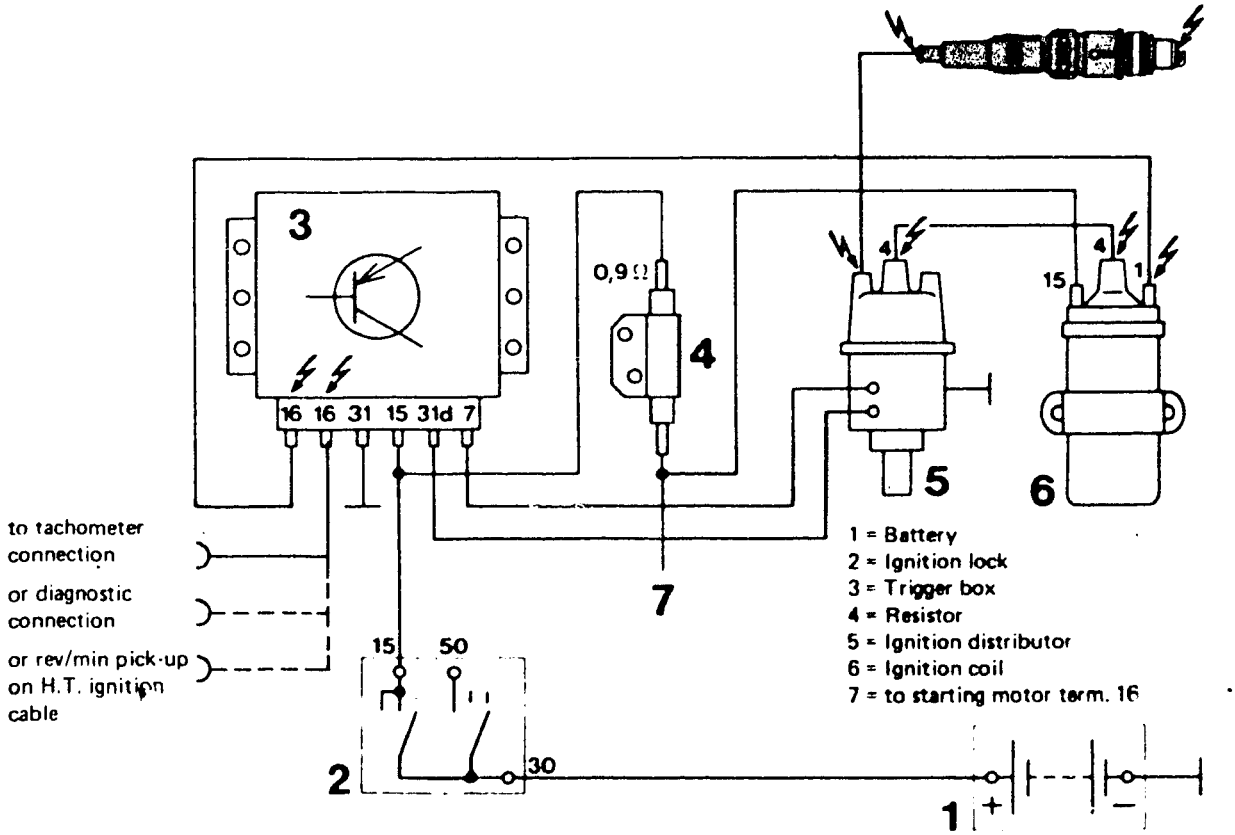
BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
© by Robert Bosch GmbH D 7 Stuttgart 1 Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

In addition, in the case of the capacitor-discharge ignition system (CDI), danger of accident is also present under the following circumstances:

- Operation of the trigger box without the ignition transformer.
- At the trigger box, (removed), relatively soon after it has been switched off (capacitor discharge).

Below is a typical terminal diagram of a semi-conductor ignition system, the danger points are marked with red high-voltage arrows. We would point out that all semi-conductor ignition systems, even the older ones, are to be regarded as dangerous in the sense as defined by this bulletin.

Please address any queries or comments c ncerning the contents of this publication to our representative in your country.




Terminal diagram

# After-sales Service

## Technical Bulletin

Only for use within the Bosch organization. Not to be communicated to any third party.

EFFECTS OF ELECTRICAL AND ELECTRONIC SYSTEMS ON HEART PACEMAKERS

e.g. ignition systems, Jetronic, Motronic, ABS

VDT-I-227/107 En
1.1981

Please ensure without fail that this Bulletin is passed on to your employees for their attention!

We have often been asked by some of our customers whether or not patients with heart pacemakers are endangered in any way by ignition systems. This theme was recently the subject of an examination carried out by the Ignition System Development Department of Robert Bosch GmbH in conjunction with Dr. Thull, lecturer at the Central Institute for Biomedical Technology at the University of Erlangen-Nürnberg and Biotronic GmbH & Co. of Berlin, a manufacturer of heart pacemakers. The magazine "Biomedizinischen Technik" (5/80) listed the results.

The most important discoveries in this practice can be summarized from the examination report as follows:-

1. Heart pacemakers corresponding to the latest state of the art are not affected by radiation (electromagnetic fields) from ignition systems.
2. With a stationary engine and the ignition switched off the heart pacemaker is not affected by any part of the ignition system, even when unintentionally touched. Maintenance work in the engine compartment, for example, can then be carried out without any danger.
3. With the engine running or stationary with the ignition switched on, touching current-carrying parts of the ignition system, as well as parts of any other electrical system, presents a certain danger for everybody. The heart pacemaker can here be affected under certain conditions (voltage, current and frequency).
   Patients with heart pacemakers should therefore at all costs avoid touching current-carrying parts of electrical systems.
4. Furthermore, patients with heart pacemakers are more inclined to psychic shock effects than other people, even when they receive just a harmless electric shock, because many such patients are conscious of the increased danger to the cardiac activity.

We therefore consider it inadvisable for patients with heart pacemakers to be employed in workshops or on vehicles where ignition systems are being tested or repaired. If any members of your staff have heart pacemakers please carry out the necessary measures.

BOSCH
Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
© by Robert Bosch GmbH D-7 Stuttgart 1 Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

We would like to add that heart pacemakers are not expected to be affected in any way by interference from other electronic products and systems which we manufacture, such as the Antiskid System (ABS), Jetronic, Motronic, because the much greater radiation intensity of the ignition systems examined in normal use has not caused any interference to heart pacemakers corresponding to the latest state of the art.

If you should receive questions on this matter from customers, please inform them accordingly.

# After-sales Service

## Technical Bulletin

Only for use within the Bosch organization Not to be communicated to any third party

NEW DESIGNATIONS FOR IGNITION SYSTEMS

VDT-I-227/108 En
i.1983

The introduction of new ignition systems has made it necessary to reclassify all designations.

The designations listed below will be used immediately in KH workshop and sales literature.

| Designation | Abbrev'd code | Meaning | Switching | Ignition control and spark advance | High-voltage distribution |
|---|---|---|---|---|---|
| Coil ignition | SZ (CI) | --------- | Mechanical (breaker points) | Mechanical (ignition distributor) | Mechanical (ignition distributor) |
| Transistor-ized coil ignition | TSZ-K (TCI-c) | K=breaker-triggered | Electronic (trigger box) | Mechanical (ignition distributor) | Mechanical (ignition distributor) |
| Trigger box with conventional circuit techniques | TSZ-I* (TCI-i) | I=Induction-type pulse generator | Electronic (trigger box) | Mechanical (ignition distributor) | Mechanical (ignition distributor) |
| | TSZ-H | H=Hall generator | Electronic (trigger box) | Mechanical (ignition distributor) | Mechanical (ignition distributor) |
| Transistor-ized ignition | TZ-I* (TI-i) | I=Induction-type pulse generator | Electronic (trigger box) | Mechanical (ignition distributor) | Mechanical (ignition distributor) |
| (Trigger box in Hybrid technique) | TZ-H* (TI-h) | H=Hall generator | Electronic (trigger box) | Mechanical (ignition distributor) | Mechanical (ignition distributor) |

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
© by Robert Bosch GmbH D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

| Designation | Abbrev'd code | Meaning | Switching | Ignition control and spark advance | High-voltage distribution |
|---|---|---|---|---|---|
| Breakerless semiconductor ignition with or without knock control | EZ<br>EZ-K | -<br>K=Knock control | Electronic (trigger box or control unit) | Electronic (control unit) | Mechanical (ignition distributor or high-voltage distributor) |
| Distributor-less ignition with or without knock control | VZ<br>VZ-K | -<br>K=Knock control | Electronic (control unit) | Electronic (control unit) | Electronic (dual-spark ignition coil, or 1 ignition coil for each spark plug) |

*Note: The ignition system can also be equipped with a DLS unit (digital idle stabilization) or with an ELS unit (electronic idle stabilization) or with an ESV unit (electronic ignition retardation).

# Table of contents


| Section | Coordinates |
|---|---|
| Structure of microfiche | A 1 |
| 1. Rapid diagnosis chart | A 2 |
| 2. Test specifications | A 7 |
| 3. Electrical terminal diagram | A 8 |
| 4. Installation position of components | A 9 |
| 5. Necessary test equipment, aids | A 10 |
| 6. Danger of accident on electronic ignition systems | A 11 |
| 7. Important vehicle information | A 14 |
| 8. Trouble-shooting program | B 1 |
| Test if ignition spark present | B 3 |
| Test if ignition spark not present | C 1 |

Table of contents (continued)


| Section | Coordinates |
|---|---|
| Technical Bulletin (Danger of accident) | L 1 |
| Technical Bulletin (Effects of electrical and electronic systems on heart pacemakers) | L 3 |
| Technical Bulletin (New designations for ignition systems) | L 5 |


© 1983 Robert Bosch GmbH
Automotive Equipment - After-Sales Service,
Department for Technical Publications KH/VDT,
Postfach 50, D-7000 Stuttgart 1

Published by: After-Sales Service, Department for Training and Technology (KH)VSK). Press date: 4.1983

Please direct questions and comments concerning the contents to our authorized representative in your country.

This publication is only for the use of the Bosch After-Sales Service Organization, and may not be passed on to third parties without our consent.

Microfilmed in the Federal Republic of Germany.
Microphotographié en République Fédérale d'Allemagne.